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(54) **SPREAD CODE ALLOCATING METHOD, DESPREADING METHOD, TRANSMITTING DEVICE, RECEIVING DEVICE, COMMUNICATING DEVICE, WIRELESS BASE STATION DEVICE, AND MOBILE TERMINAL DEVICE**

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H04J 4/00 (2006.01)
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(52) **U.S. Cl.**
USPC **370/478**; 375/141

(58) **Field of Classification Search**
USPC 370/203, 208, 464, 478; 455/91, 455/101
See application file for complete search history.

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(57) **ABSTRACT**

A communication system, including a transmitter that transmits a signal by using a two-dimensional spread code used for making a spread in time and frequency directions and a receiver that receives the signal transmitted from the transmitter, where the transmitter includes a selecting unit that selects spread codes in which at least one of the time and the frequency directions are mutually orthogonal, and a transmitting unit that spreads a signal by using the selected spread codes and transmits the signal, where each of the selected spread codes are able to be split in two or more parts, which are mutually orthogonal with the same parts of other selected spread codes in at least one of the time and the frequency directions.

1 Claim, 27 Drawing Sheets